Bochang Moon

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Education

- **Ph.D.** in Computer Science, KAIST, Korea — Feb. 2010 – Aug. 2014
  Thesis: Acceleration Techniques for Monte Carlo Ray Tracing
  Advisor: Sung-Eui Yoon
- **M.S.** in Computer Science at KAIST, Korea — Feb. 2008 – Jan. 2010
  Thesis: Cache-Oblivious Ray Reordering
  Advisor: Sung-Eui Yoon
- **B.S.** in Computer Science at Chung-Ang university, Korea — Mar. 2004 – Feb. 2008
  Graduated top of the college of engineering (GPA: 4.35/4.50)

Professional Experience

- **Assistant Professor**, Gwangju Institute of Science and Technology — Sep. 2016 - present
- **Post Doc,** Disney Research Zürich (based on Edinburgh) — Nov. 2014 – July 2016
- **Post Doc**, Dept. of Computer Science, KAIST — Sep. 2014 – Oct. 2014
- **Research Intern**, Adobe, US (mentor: Nathan Carr) — Jun. 2011 – Sep. 2011
- **Research Assistant**, Scalable Graphics/Geometric Algorithm Lab., KAIST — Feb. 2008 – Aug. 2014
- **Teaching Assistant**, Dept. of Computer Science, KAIST — Feb. 2009 – Jan. 2011

Research Interests

- Cache-coherent algorithms for ray tracing
- Sampling and reconstruction for Monte Carlo ray tracing
- Real-time rendering

Awards

- Significant New Researcher Award at Korea Computer Graphics Society 2014
- 3rd place at ACM Student Research Competition (SRC) Grand Finals held at ACM Awards Banquet
  1st place at ACM SRC held at ACM SIGGRAPH 2009
  RACBVHs: Random-Accessible Compressed Bounding Volume Hierarchies
  Tae-Joon Kim, **Bochang Moon**, Duksu Kim, Sung-Eui Yoon

Publications (Conference / Journal papers)

1. Noise Reduction on G-Buffers for Monte Carlo Filtering

   Bochang Moon, Jose A Iglesias-Guitian, Steven McDonagh, Kenny Mitchell

   Computer Graphics Forum (accepted), 2017

2. Pixel History Linear Models for Real-Time Temporal Filtering

   Jose A Iglesias-Guitian, **Bochang Moon**, Charalampos Koniaris, Eric Smolikowski, Kenny Mitchell

   Computer Graphics Forum (Proceedings of Pacific Graphics 2016), vol. 35, no. 7, pp. 363-372, Oct. 2016

3. Nonlinearly Weighted First-order Regression for Denoising Monte Carlo Renderings

   Benedikt Bitterli, Fabrice Rousselle, **Bochang Moon**, Jose A. Iglesias-Guitian, David Adler, Kenny Mitchell, Wojciech Jarosz, Jan Novak

   Computer Graphics Forum (Proceedings of Eurographics Symposium on Rendering 2016), vol. 35, no. 4, July 2016

4. User, Metric, and Computational Evaluation of Foveated Rendering Methods

   Nicholas T. Swafford, Charalampos Koniaris, Jose A. Iglesias-Guitian, **Bochang Moon**, Darren Cosker,

   Kenny Mitchell

   Proceedings of ACM Symposium on Applied Perception, July 2016

5. Adaptive polynomial rendering

   Bochang Moon, Steven McDonagh, Kenny Mitchell, Markus Gross

   ACM Transactions on Graphics (Proceedings of SIGGRAPH 2016), vol. 35, no. 4, pp. 40:1-40:10, July 2016

6. Adaptive rendering with linear predictions

   Bochang Moon, Jose A. Iglesias-Guitian, Sung-Eui Yoon, Kenny Mitchell

   ACM Transactions on Graphics (Proceedings of SIGGRAPH 2015), vol. 34, no. 4, pp. 121:1-121:11, Aug. 2015

7. Recent advances in adaptive sampling and reconstruction for Monte Carlo rendering

   Matthias Zwicker, Wojciech Jarosz, Jaakko Lehtinen, **Bochang Moon**, Ravi Ramamoorthi,

   Fabrice Rousselle, Pradeep Sen, Cyril Soler, Sung-Eui Yoon

   Computer Graphics Forum (Proceedings of Eurographics 2015), vol. 34, no. 2, pp. 667-681, May 2015

8. Adaptive rendering based on weighted local regression

   Bochang Moon, Nathan Carr, Sung-Eui Yoon

   ACM Transactions on Graphics (Presented at SIGGRAPH 2015), vol. 33, no. 5, pp. 170:1-170:14, Aug. 2014

9. P-RPF: pixel-based random parameter filtering for Monte Carlo rendering

   Hyosub Park, **Bochang Moon**, Soomin Kim, Sung-Eui Yoon

   Proceedings of Computer-Aided Design and Computer Graphics (CAD/Graphics), pp. 123 - 130, Nov. 2013

10. Robust image denoising using a virtual flash image for Monte Carlo ray tracing

    Bochang Moon, Jong Yun Jun, JongHyeob Lee, Kunho Kim, Toshiya Hachisuka, Sung-Eui Yoon

    Computer Graphics Forum (Presented at Eurographics Symposium on Rendering 2014), vol. 32, No. 1, pp. 139-151, Feb. 2013

11. Cache-oblivious ray reordering

Bochang Moon, Youngyong Byun, Tae-Joon Kim, Pio Claudio, Hye-sun Kim, Yun-ji Ban, Seung Woo Nam, Sung-Eui Yoon

ACM Transactions on Graphics (Presented at SIGGRAPH 2011), vol. 29, no. 3, pp. 28:1-28:10, June 2010

12. HCCMeshes: hierarchical-culling oriented compact meshes

    Tae-Joon Kim, Yongyoung Byun, Yongjin Kim, **Bochang Moon**, Seungyong Lee, Sung-Eui Yoon

    Computer Graphics Forum (Proceedings of Eurographics 2010), vol. 29, no. 2, pp. 299-308, May 2010

13. RACBVHs: random-accessible compressed bounding volume hierarchies

    Tae-Joon Kim, **Bochang Moon**, Duksu Kim, Sung-Eui Yoon

    IEEE Transactions on Visualization and Computer Graphics, vol. 16, no. 2, pp. 273-286, Mar. 2010

Presentations (Short Papers/Posters/Exhibitions)

1. Interactive Ray-Traced Area Lighting with Adaptive Polynomial Filtering

   Jose A. Iglesias Guitian, **Bochang Moon**, Kenny Mitchell

   The 13th European Conference on Visual Media Production (CVMP), London, 2016

2. IRIDiuM: Immersive Rendered Interactive Deep Media

   Babis Koniaris, Maggie Kosek, Ivan Huerta, Karen Darragh, Charles Malleson, Joanna Jamrozy, Nick Swafford, Jose A. Iglesias Guitian, **Bochang Moon**, Ali Israr, Kenny Mitchell

   VR Village in SIGGRAPH 2016

Domestic Publications

1. SURE-based-Trous Wavelet Filter for Interactive Monte Carlo Rendering

   Soomin Kim, **Bochang Moon**, Sung-Eui Yoon

   Journal of KIISE, vol. 43, no. 8, pp. 835-840, Aug. 2016

Invited Talks

1. Local Regression based Denoising for Ray Tracing
   a. Kwangwoon University, Mar. 16, 2017
   b. KAIST, Aug. 16, 2016

Patents

1. Adaptive sampling guided by multilateral filtering

   Bochang Moon, Nathan Carr

   Registration #: 08824834, US, 02 Sep. 2014

2. Method for removing image noise on basis of stochastic rendering

   Sung-Eui Yoon, **Bochang Moon**, Kunho Kim, Jong Yun Jun, Jong Hyeob Lee

   Publication #: WO/2013/137522, PCT, 19 Sep. 2013

3. Noise reduction method for stochastic rendering image

   Sung-Eui Yoon, **Bochang Moon**, Kunho Kim, Jong Yun Jun, Jong Hyeob Lee

Registration #: 1012827000000, Korea, 01 July 2013

Professional Activities

- Associate Editor of The Visual Computer, Sep. 2016 - present
- Program Committee of EGSR 2017
- Reviewer for ACM SIGGRAPH, ACM SIGGRAPH ASIA, ACM Transactions on Graphics, IEEE TVCG, Pacific Graphics, Visual Computer, ACM TOPLAS

Press Releases

- "Disney Research rendering method preserves detail in film quality production graphics"
  - Phys, Aug. 5, 2015, http://phys.org/news/2015-08-team-method-quality-production-graphics.html
- "Adaptive rendering method reduces discolored pixels in photo-realistic images"
  - Phys, July 20, 2016, https://phys.org/news/2016-07-method-discolored-pixels-photo-realistic-images.html

Research Grants

1. Developed intelligent UXUI technology for AR glasses-based docent operation, 2017.04-2017.12.31, MCST, 30M won ($30K)
2. 3D Indoor Reconstruction and Its Applications, 2017.05-2017.12, PI, GIST, approximately 60M won ($60K)
3. Denoising for Physically based Rendering, 2017.03 – 2019.02, PI, NRF, 225M won ($225K)
4. Denoising Techniques for Monte Carlo Ray Tracing, 2016.09 – 2016.12, PI, GIST, 19M won ($19K)
5. Optimization Techniques for Photorealistic Rendering, 2016.09 – 2018.08, PI, GIST seed grant, 70M won ($70K)
6. Startup funding, 2016.09 – 2017.12, PI, GIST seed grant, 130M won ($130K)

Teaching

1. Introduction to Computer Graphics
   a. spring 2017

Supervised Students

1. Saerom Ha (하새롬), MS course, 2017.03 – present

Interns: Sunhwa Kim (김선화, 2017.02)

Dissertation Committee for MS and Ph.D Students

MS Students: Yunjeong Choi (최윤정, advisor: Jeha Ryu, 2016.12), Jae-Won Ye (예재원, advisor: Kuk-Jin Yoon, 2016.12)